AMENDMENT AND RESPONSE UNDER 37 C.F.R. § 1.111

Serial Number: 10/716,269

Filing Date: November 17, 2003

Title: METHOD FOR PASSIVE PHASE CHANGE THERMAL MANAGEMENT

Assignee: Intel Corporation

## IN THE CLAIMS

Please amend the claims as follows:

- (Currently Amended) A method of forming an integrated circuit heat sink comprising:
   forming a metal conductive structure having a cavity;
   injecting a phase change material into the cavity;
   injecting a plurality of non-phase changing spheres into the phase change material; and sealing the cavity.
- 2. (Previously Presented) The method of claim 1, wherein forming a metal conductive structure having a cavity comprises:

forming a metal conductive structure having a cavity including a cavity surface having a plurality of ramp structures formed on the cavity surface.

3. (Original) The method of claim 1, wherein injecting a phase change material into the cavity comprises:

injecting TH58 into the cavity.

4. (Original) The method of claim 1, wherein injecting a plurality of spheres into the cavity comprises:

injecting a plurality of solid spheres into the cavity.

- 5. (Previously Presented) The method of claim 1, wherein sealing the cavity comprises: closing an injection hole in the metal conductive structure.
- 6-16. (Canceled)

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17. (Previously Presented) A method of forming an integrated circuit heat sink comprising: forming a metal conductive structure having a cavity and a plurality of fins; injecting a phase change material into the cavity; injecting a plurality of mixing spheres into the phase change material; and sealing the cavity.

- 18. (Previously Presented) The method of claim 17, wherein forming a metal conductive structure having a cavity and a plurality of fins includes forming a substantially flat surface on an external surface of the metal conductive structure.
- 19. (Previously Presented) The method of claim 18, wherein forming a substantially flat surface on an external surface of the metal conductive structure includes forming the flat surface by machining.
- 20. (Previously Presented) The method of claim 18, wherein forming a substantially flat surface on an external surface of the metal conductive structure includes forming the flat surface having a footprint that is significantly larger than the surface area of an integrated circuit die to which the metal conductive structure is to be attached.
- 21. (Currently Amended) A method of forming an integrated circuit heat sink comprising:
  forming a metal conductive structure having a cavity;
  injecting a phase change material into the cavity;
  intermixing a plurality of fluid mixing spheres having a density about equal to the density
  of the phase change material into the phase change material; and
  sealing the cavity.
- 22. (Previously Presented) The method of claim 21, wherein intermixing a plurality of spheres into the phase change material includes selecting a number of the plurality of spheres intermixed to be a large enough number to enhance convective cooling in the phase change material.

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23. (Previously Presented) The method of claim 21, further including coupling the metal conductive structure to an integrated circuit die.

24. (Previously Presented) A method of forming an integrated circuit heat sink comprising: forming a pair of symmetrical structures, each of the pair of symmetrical structures having a volume;

coupling the pair of symmetrical structures to form a cavity; injecting a phase change material into the cavity; injecting a plurality of fluid mixing spheres into the phase change material; and sealing the cavity.

- 25. (Previously Presented) The method of claim 24, wherein forming a pair of symmetrical structures includes forming the volume of each of the pair of symmetrical structures to be approximately one-half of a volume of the cavity.
- 26. (Previously Presented) The method of claim 24, wherein forming a pair of symmetrical structures includes forming fins on an external surface of each of the pair of symmetrical structures.
- 27. (Previously Presented) The method of claim 26, wherein forming fins on an external surface of each of the pair of symmetrical structures includes attaching the fins using a metal fusing process.